Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application. Applicant has submitted a new complete claim set showing marked up claims with insertions indicated by underlining and deletions indicated by strikeouts and/or double bracketing.

Listing of Claims:

Claim 1 (Previously Presented):   A method for fast channel changing in a multicast video distribution architecture, the method comprising:

buffering a multicast video stream segment, the buffered multicast video stream segment including a first retained intra frame and a second retained intra frame, the first retained intra frame being before the second retained intra frame in the buffered multicast video stream segment;

detecting a channel change request that indicates a requested channel, the requested channel corresponding to the buffered multicast video stream segment;

transmitting a retained intra frame and no dependent frames for the requested channel as a unicast communication for static display, wherein,

if a first next decodable non-intra frame after the first retained intra frame is at least a joining time after a send point of the buffered multicast video stream segment, the transmitted retained intra frame is the first retained intra frame and the first next decodable non-intra frame after the first retained intra frame is a joining frame, and wherein

if the first next decodable non-intra frame after the first retained intra frame is less than the joining time after the send point of the buffered multicast video stream segment, the transmitted retained intra frame is the second retained intra frame

and a second next decodable non-intra frame after the second retained intra frame is the jointing frame; and

synchronizing a multicast joining operation to the multicast group corresponding to the requested channel, wherein synchronizing includes ensuring a first multicast frame after the multicast joining operation is the joining frame.

Claim 2 (Currently Amended):   The method as recited in claim ~~0~~1, further comprising:

caching at least one previous intra frame for each channel of a plurality of channels as a set of cached intra frames; and

retrieving, responsive to the detecting, the retained intra frame for the requested channel from the set of cached intra frames, the retained intra frame comprising a previous intra frame.

Claim 3 (Currently Amended):   The method as recited in claim ~~0~~1, wherein:

the detecting comprises detecting the channel change request from a particular client; and

the transmitting comprises transmitting the retained intra frame to the particular client.

Claim 4-5 (Canceled).

Claim 6 (Previously Presented):   The method as recited in claim 1, further comprising:

wherein the joining comprises determining when the retained intra frame reaches a joining time of the buffered video stream portion.

Claim 7-11 (Canceled)

Claim 12 (Currently Amended):   One or more processor-accessible media comprising processor-executable instructions that, when executed, direct an apparatus to perform the method as recited in claim ~~6~~1.

Claim 13 (Previously Presented):   A channel change server comprising:

cached intra frames for a plurality of video streams, each respective video stream of the plurality of video streams associated with a respective channel of a plurality of channels;

a channel change request detector that is capable of detecting channel change requests from individual clients of a plurality of clients; and

a channel change request handler that is configured to respond to a detected channel change request from a particular client of the plurality of clients by extracting a most recent intra frame of a video stream associated with a requested channel from the cached intra frames and by transmitting the extracted most recent intra frame and no dependent frames for a static display to the particular client using a unicast communication and by joining the video stream associated with the requested channel at a next intra frame for dynamic display of the next intra frame and a plurality of subsequent dependent frames using a multicast communication.

Claim 14 (Currently Amended):   The channel change server as recited in claim ~~6~~13, further comprising:

an intra frame cacher that is adapted to extract intra frames from the plurality of video streams and to cache at least a most recent intra frame for each video stream of the plurality of video streams.

Claim 15 (Currently Amended): The channel change server as recited in claim ~~0~~13, further comprising:

     a join command issuer that is adapted to send a join message to a replication point to cause the replication point to join the particular client to a multicast group corresponding to the requested channel.

Claim 16 (Currently Amended): The channel change server as recited in claim ~~0~~13, further comprising:

     a join command issuer that is adapted to send a join instruction message to the particular client, the join instruction message stipulating an appointed time at which the particular client is to transmit a join message to a replication point.

Claim 17 (Currently Amended): The channel change server as recited in claim ~~0~~13, further comprising:

     a synchronization determiner that is adapted to synchronize a multicast joining operation for the particular client to a multicast group corresponding to the requested channel with regard to the next intra frame of the video stream associated with the requested channel.

Claim 18 (Currently Amended): The channel change server as recited in claim ~~0~~17, wherein the synchronization determiner is further adapted to synchronize the multicast joining operation for the particular client to the multicast group corresponding to the requested channel using a quasi-predicted time of the next intra frame of the video stream associated with the requested channel.

Claim 19 (Currently Amended): The channel change server as recited in claim ~~0~~17, further comprising:

a time-delayed buffered portion of the video stream that is associated with the requested channel;

wherein the synchronization determiner is further adapted to synchronize the multicast joining operation for the particular client to the multicast group corresponding to the requested channel with regard to the time-delayed buffered portion of the video stream that is associated with the requested channel.

Claim 20 (Currently Amended): The channel change server as recited in claim ~~θ~~19, wherein a size of the time-delayed buffered portion corresponds to a time period consumed when joining the particular client to the multicast group corresponding to the requested channel.

Claim 21 (Currently Amended): The channel change server as recited in claim ~~θ~~19, wherein the synchronization determiner is further adapted to determine that a join command is to be issued when the synchronization determiner ascertains that the next intra frame is present within the time-delayed buffered portion of the video stream that is associated with the requested channel.

Claim 22 (Currently Amended): The channel change server as recited in claim ~~θ~~19, wherein the synchronization determiner is further adapted to prompt issuance of a join command as soon as the next intra frame is ascertained to be present within the time-delayed buffered portion of the video stream that is associated with the requested channel even if the extracted most recent intra frame of the video stream associated with the requested channel has not been fully delivered to the particular client using the unicast communication.

Claim 23 (Previously Presented): A channel change server comprising:

retained intra frames for a plurality of video streams, each respective video stream of the plurality of video streams associated with a respective channel of a plurality of channels;

a channel change request detector that is capable of detecting channel change requests from individual clients of a plurality of clients; and

a channel change request handler that is configured to respond to a detected channel change request from a particular client of the plurality of clients by extracting a retained intra frame of a video stream associated with a requested channel from the retained intra frames and by transmitting the extracted retained intra frame and no dependent frames to the particular client for static display using a unicast communication and by joining the video stream associated with the requested channel at a next intra frame for dynamic display of the next intra frame and a plurality of subsequent dependent frames using a multicast communication.

Claim 24 (Currently Amended):   The channel change server as recited in claim ~~0~~23, further comprising:

a video stream bufferer that is adapted to buffer each video stream of the plurality of video streams to create a plurality of respective buffered portions.

Claim 25 (Currently Amended):   The channel change server as recited in claim ~~0~~23, further comprising:

a join command issuer that is adapted to send a join message to a replication point to cause the replication point to join the particular client to a multicast group corresponding to the requested channel.

Claim 26 (Currently Amended):   The channel change server as recited in claim ~~0~~23, further comprising:

a join command issuer that is adapted to send a join instruction message to the particular client, the join instruction message stipulating an appointed time at which the particular client is to transmit a join message to a replication point.

Claim 27 (Currently Amended):   The channel change server as recited in claim ~~0~~23, further comprising:

a synchronization determiner that is adapted to synchronize a multicast joining operation for the particular client to a multicast group corresponding to the requested channel with regard to a next decodable frame of the video stream associated with the requested channel.

Claim 28 (Currently Amended):   The channel change server as recited in claim ~~0~~27, wherein the synchronization determiner is further adapted to synchronize the multicast joining operation for the particular client to the multicast group corresponding to the requested channel using a quasi-predicted time of the next decodable frame of the video stream associated with the requested channel.

Claim 29 (Currently Amended):   The channel change server as recited in claim ~~0~~27, further comprising:

a time-delayed buffered portion of the video stream that is associated with the requested channel;

wherein the synchronization determiner is further adapted to synchronize the multicast joining operation for the particular client to the multicast group corresponding to the requested channel with regard to the time-delayed buffered portion of the video stream that is associated with the requested channel.

Claim 30 (Currently Amended): The channel change server as recited in claim ~~30~~29, wherein a size of the time-delayed buffered portion corresponds to a time period consumed when joining the particular client to the multicast group corresponding to the requested channel.

Claim 31 (Currently Amended): The channel change server as recited in claim ~~30~~29, wherein a size of the time-delayed buffered portion corresponds to a combination of a multicast joining time and an intra frame interval duration.

Claim 32 (Currently Amended): The channel change server as recited in claim ~~30~~29, wherein a joining time of the time-delayed buffered portion corresponds to a time period consumed when joining the particular client to the multicast group corresponding to the requested channel.

Claim 33 (Currently Amended): The channel change server as recited in claim ~~30~~29, wherein the synchronization determiner is further adapted to determine that a join command is to be issued when the synchronization determiner ascertains that the next decodable frame is subsequent to a joining time of the time-delayed buffered portion of the video stream that is associated with the requested channel.

Claim 34 (Currently Amended): The channel change server as recited in claim ~~30~~29, wherein the synchronization determiner is further adapted to prompt issuance of a join command as soon as the next decodable frame is ascertained to be entering a joining time of the time-delayed buffered portion of the video stream that is associated with the requested channel even if the extracted retained intra frame of the video stream associated with the requested channel has not been fully delivered to the particular client using the unicast communication.

Claim 35 (Previously Presented):   An arrangement for channel changing, comprising:

retention means for retaining at least one intra frame for each video stream of a plurality of video streams, each respective video stream associated with a respective channel of a plurality of channels;

detection means for detecting a channel change request from a client that indicates a requested channel, the channel change request from the client signifying a demand to switch from a first multicast group to a second multicast group that corresponds to the requested channel; and

handler means for handling the channel change request by transmitting a retained intra frame and no dependent frames to the client via a unicast communication for static display, the retained intra frame retained by the retention means from a respective video stream that is associated with the requested channel, and by joining the second multicast group at a subsequent intra frame for dynamic display of the subsequent intra frame and a plurality of subsequent dependent frames.

Claim 36 (Currently Amended):   The arrangement as recited in claim 035, further comprising:

buffer means for buffering each respective video stream of the plurality of video streams to establish a respective buffered portion for each respective video stream; and

synchronization means for synchronizing a joining of the client to the second multicast group (i) with reference to a respective buffered portion for the respective video stream that is associated with the requested channel and (ii) with regard to a next decodable frame of the respective video stream that is associated with the requested channel.

Claim 37 (Currently Amended):   The arrangement as recited in claim 0~~36~~, further
comprising:

issuance means for issuing a join command responsive to the synchronization
means.

Claim 38 (Currently Amended):   The arrangement as recited in claim 0~~35~~, wherein
the retention means comprises at least one of (i) buffering means for buffering the at
least one intra frame for each video stream of the plurality of video streams and (ii)
caching means for caching at least one intra frame for each video stream of the plurality
of video streams.

Claim 39 (Currently Amended):   The arrangement as recited in claim 0~~35~~, wherein
the arrangement comprises at least one server.

Claim 40 (Currently Amended):   The arrangement as recited in claim 0~~35~~, wherein
the arrangement comprises one or more processor–accessible media.

Claim 41 (Previously Presented):   A server that is configured to retain at least one
independent frame for each video channel of a plurality of video channels that are being
distributed using multicast communications and that is adapted to respond to channel
change requests from clients by transmitting the retained at least one independent
frame and no dependent frames of a requested video channel to a requesting client
using a unicast communication for static display and by joining the multicast
communication by providing a subsequent independent frame and a plurality of
subsequent dependent frames for dynamic display.

Claim 42 (Currently Amended): The server as recited in claim 0̶41, wherein the server is capable of multicasting the plurality of video channels to the clients.

Claim 43-46 (Canceled):

Claim 47 (Currently Amended): The server as recited in claim 0̶41, wherein the server is further adapted to issue a join command irrespective of a complete or an incomplete delivery to the requesting client of the retained at least one independent frame of the requested video channel.

Claim 48 (Previously Presented): A system comprising:
    at least one processor; and
    one or more media including processor-executable instructions that are capable of being executed by the at least one processor, the processor-executable instructions adapted to direct the system to perform actions comprising:
    multicasting a plurality of channels;
    retaining at least one intra frame for each channel of the plurality of channels;
    transmitting a retained intra frame and no dependent frames for a requested channel as a unicast communication for static display responsive to a channel change request; and
    joining the multicast communication by providing a subsequent independent frame and a plurality of subsequent dependent frames for dynamic display.

Claim 49 (Currently Amended): The system as recited in claim 0̶48, wherein the system comprises a video provider and a channel change server.

Claim 50 (Currently Amended): The system as recited in claim 048, wherein the system comprises a video provider and a channel change server that are co-located.

Claim 51 (Currently Amended): The system as recited in claim 048, wherein the system comprises a channel change server that receives the plurality of channels from a video provider; and wherein the channel change server performs the action of multicasting the plurality of channels.

Claim 52 (Currently Amended): The system as recited in claim 048, wherein the processor-executable instructions are adapted to cause the system to perform a further action comprising:

synchronizing a multicast joining operation to a multicast group corresponding to the requested channel with regard to a next decodable frame of the requested channel.

Claim 53 (Currently Amended): The system as recited in claim 052, wherein the processor-executable instructions are adapted to cause the system to perform a further action comprising:

buffering a video stream portion of a video stream that is associated with the requested channel;

wherein the action of synchronizing comprises an action of determining when the next decodable frame is present within the buffered video stream portion of the video stream that is associated with the requested channel, the next decodable frame comprising a next intra frame.

Claim 54 (Currently Amended):   The system as recited in claim 0̶52, wherein the processor-executable instructions are adapted to cause the system to perform a further action comprising:

buffering a video stream portion of a video stream, which is associated with the requested channel, to a length that at least equals a sum of a multicast joining time and an intra frame interval duration;

wherein the action of synchronizing comprises an action of determining when the next decodable frame is entering the multicast joining time part of the buffered video stream portion of the video stream, the next decodable frame comprising a next non-intra frame.

Claim 55 (Currently Amended):   The system as recited in claim 0̶52, wherein the processor-executable instructions are adapted to cause the system to perform a further action comprising:

issuing a join command responsive to the synchronizing.

Claim 56 (Previously Presented):   A method for fast channel changing in a multicast video distribution architecture, the method comprising:

sending a channel change request to a server, the channel change request indicating a requested channel, the server buffering a multicast video stream segment, the buffered multicast video stream segment including a first retained intra frame and a second retained intra frame, the first retained intra frame being before the second retained intra frame in the buffered multicast video stream segment, the requested channel corresponding to a multicast group and the buffered multicast video stream segment corresponding to the requested channel;

receiving a retained intra frame for the requested channel as a unicast communication, wherein

if a first next decodable non-intra frame after the first retained intra frame is at least a joining time after a send point of the buffered multicast video stream segment, the transmitted retained intra frame is the first retained intra frame and the first next decodable non-intra frame after the first retained intra frame is a jointing frame, and wherein

if the first next decodable non-intra frame after the first retained intra frame is less than the joining time after the send point of the buffered multicast video stream segment, the transmitted retained intra frame is the second retained intra frame and a second next decodable non-intra frame after the second retained intra frame is the jointing frame;

statically displaying the received retained intra frame;

receiving as a multicast communication a portion of the multicast video stream corresponding to the requested channel, wherein the initial multicast frame of the multicast video stream received is the joining frame, the portion including a plurality of consecutive multicast frames of the multicast video stream; and

switching from statically displaying the received retained intra frame to displaying the portion of the multicast video stream.

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